DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

DETTERMAN ANI

FOLIO OF THE CHIGNIK AND SUTWIK ISLAND QUADRANGLES, ALASKA

MISCELLANEOUS FIELD STUDIES

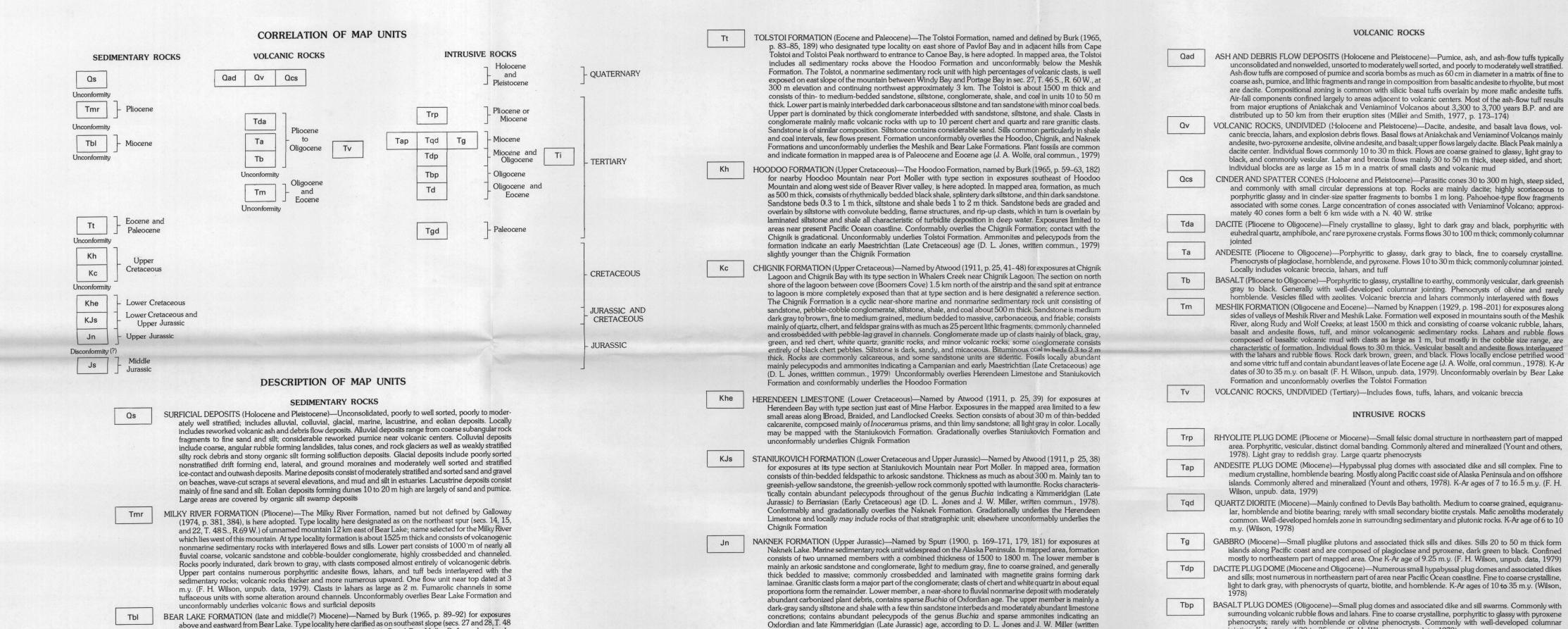
MAP MF - 1053 - N

SHEET 1 OF 2

DETTERMAN AND OTHERS-MEGAFOSSIL LOCALITIES AND STRATIGRAPHIC SECTIONS



## MEGAFOSSIL SAMPLE LOCALITY MAP



commun., 1978). Disconformably (?) overlies the Shelikof Formation and conformably and gradationally

shore of Shelikof Strait. Dark-olive-gray siliceous siltstone with thin silty sandstone interbeds and numerous

concretions of limestone and marcasite. In the mapped area exposed along the sole of a thrust fault in the

mountains between head of Through Creek and Conglomerate Creek. Section about 150 to 180 m thick.

Contains abundant ammonites, mainly Cadoceras and Pseudocadoceras, indicating an early to middle

Callovian (Middle Jurassic) age (R. W. Imlay, written commun., 1978). Disconformably(?) underlies Naknek

Js SHELIKOF FORMATION (Middle Jurassic)—Named by Capps (1923, p. 97 –101) for exposures on northwest

underlies the Staniukovich Formation

S., R. 69 W.) of mountain 10 km east of Bear Lake, Chignik A-7 and Port Moller D-1 quadrangles. In

mapped area, formation is 1000 to 1525 m thick and consists of inner neritic and nonmarine sandstone,

thickness; individual beds range from 6 cm to 1 m in thickness. Rocks dark brown to pale yellowish brown.

Sandstone moderately well sorted and grains moderately well rounded. Conglomerate made up of well-

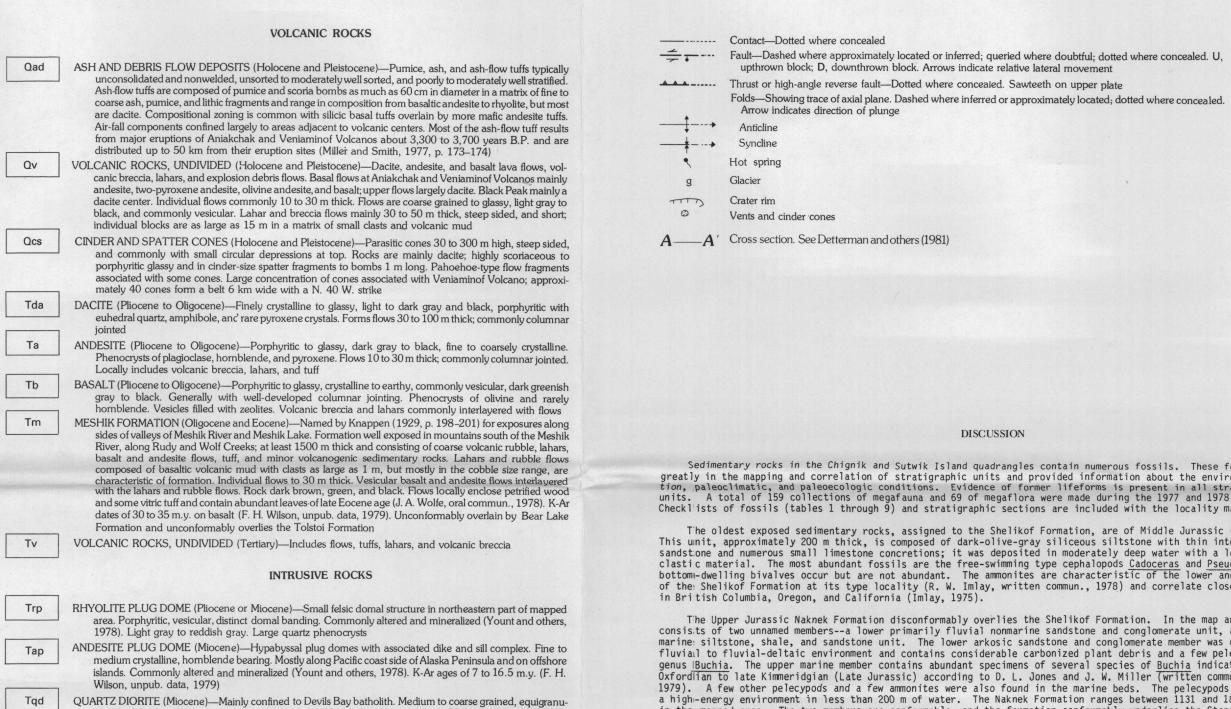
rounded clasts, about a third of which are quartz and chert, a third volcanic fragments, and the remainder

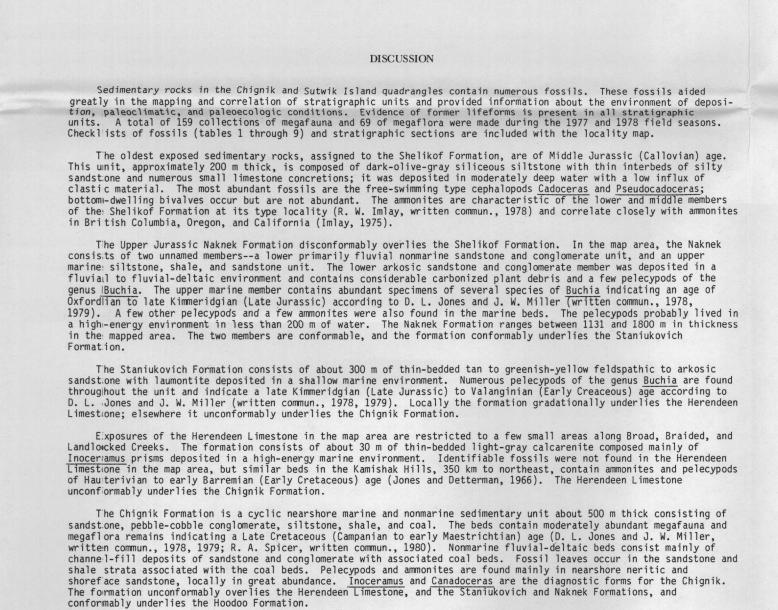
lithic sedimentary clasts. Crossbedding and channeling common in lower part of formation. Abundantly

fossiliferous in well defined horizons in upper part; fossils mainly pelecypods, gastropods, and echinoids of

late Miocene age (Louie Marincovich, Jr., and C. W. Allison, written commun., 1978). Unconformably overlies Meshik and Tolstoi Formations and unconformably underlies the Milky River Formation

conglomerate, siltstone, shale, and thin coal beds. Formation is rhythmically bedded in units 1 to 10 m in





Black rhythmically bedded shale, dark splintery siltstone, and thin sandstone, all of deep-water origin and in part turbidites, comprise the Hoodoo Formation. Megafaunal remains consist only of free-floating ammonites and a few Inoceramus carried in by turbidity currents. On the basis of this meager megafaunal data, D. L. Jones (written commun., 1978) has assigned an age of early Maestrichtian (Late Cretaceous), slightly younger than the Chignik Formation, to these beds. Field relations support this age assignment because in all localities where the underlying beds are exposed, the Chignik Formation conformably underlies the Hoodoo Formation. A major stratigraphic unconformity occurs Tertiary rocks of the Alaska Peninsula are dominantly nonmarine volcaniclastic sedimentary and volcanic rocks. The Tolstoi Formation, the oldest Tertiary unit exposed in the map area, is about 1380 to 1500 m thick and comprises massive conglomerate composed mainly of volcanic clasts, thin-bedded to massive sandstone, siltstone, shale, tuff, and coal deposited in a fluvial environment. The numerous conglomerate beds are channel-fill deposits. An abundant megaflora is found in the fine-grained rocks that represent overbank and flood-plain deposits. Excellent specimens are also obtained from some tuff beds. The lower part of the stratigraphic sequence is mainly dark siltstone with massive sandstone interbeds that contain a fossil flora of early late Paleocene age (J. A. Wolfe, written commun., 1980); overlying these beds are massive sandstone and siltstone units containing a fossil flora of latest Paleocene age. These beds do not contain the volcanic debris or conglomerate characteristic of the upper part of the section, which is of early Eocene age according to Wolfe (written commun., 1980). The formation is internally comformable, but a major period of erosion preceded deposition of the Tolstoi; the basal beds rest unconformably upon strata ranging in age from Upper Jurassic (Naknek Formation) to Upper Cretaceous (Hoodoo Formation). The Meshik Formation is a volcanic unit that contains a few intervals of volcaniclastic sedimentary rocks. Only a few collections were made from these rocks; one collection contained numerous specimens of the pelecypod Ostrea, a form which lived in a shallow estuarine environment and is regarded as Eocene to Oligocene in age according to L. N. Marincovich (written commun., 1978). The other collections consist of megaflora preserved in sandstone and water-laid tuff beds. These numerous excellent specimens are characteristic of the late Eocene (Wolfe, written commun., 1980).

tuff beds. These numerous excellent specimens are characteristic of the late Eocene (Wolfe, written commun., 1980). Many well-preserved petrified logs are found throughout the formation, some occurring in growth positions along the shore of Kujulik Bay. The wood indicates a diverse hardwood element found in the present-day warm to hot climates with abundant precipitation (R. A. Scott, written commun., 1980). The Meshik Formation unconformably overlies the Tolstoi Formation and is unconformably overlain by the Bear Lake Formation.

The Bear Lake Formation is 1000 to 1525 m thick and consists of inner neritic and nonmarine sandstone, conglomerate, siltstone, shale, and thin coal beds in rhythmically bedded units 1 to 10 m thick. An abundant marine megafauna is present in the upper 125 m of the formation. It consists mainly of pelecypods and gastropods but includes some well-preserved echinoids. The genera are all characteristic of a shallow water environment, probably very near to shoreline according to L. N. Marincovich (written commun., 1979), and are correlated with the Wishkahan Stage (late middle to early late Miocene) of the Pacific Northwest molluscan chronology. The basal Unga Conglomerate Member (Burk, 1965) is not recognized in the map area.

The youngest (pre-Quaternary) exposed consolidated sedimentary unit is the nonmarine fluvial volcaniclastic Milky River Formation present along the Bristol Bay side of the Alaska Peninsula. These beds contain a few plant scraps, but no identifiable remains were found.

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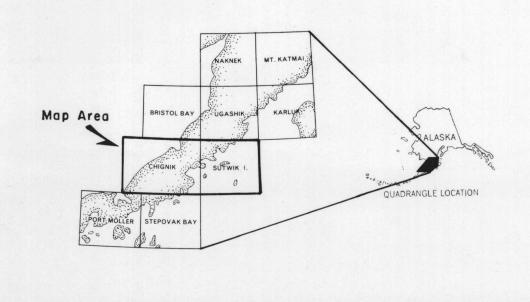
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MEGAFOSSIL SAMPLE LOCALITY MAP, CHECKLISTS, AND STRATIGRAPHIC SECTIONS OF THE CHIGNIK AND SUTWIK ISLAND QUADRANGLES, ALASKA

jointing. K-Ar ages of 30 to 35 m.y. (F. H. Wilson, unpub. data, 1979)

Td DIORITE (Oligocene and Eocene)—Small plutons of medium- to coarse-grained homblende-bearing equigr

Tgd GRANODIORITE (Paleocene)—Biotite granodiorite of the Semidi Islands batholith. Medium- to coarse-grained

Ti INTRUSIVE ROCKS, UNDIVIDED (Tertiary)—Small stocks and plugs mainly hypabyssal fine- to medium-

rock dated by K-Ar method, using new decay constants, at 59.3 m.y. (Kienle and Turner, 1976, p. 9–11)

lar rocks with some small biotite crystals. Commonly altered and mineralized (Yount and others, 1978).

Some of the rocks porphyritic with homblende crystals to 1 cm. K-Ar dates of 32 to 40 m.y. (F. H. Wilson,